

The "Shielded Five" Neutrodyne

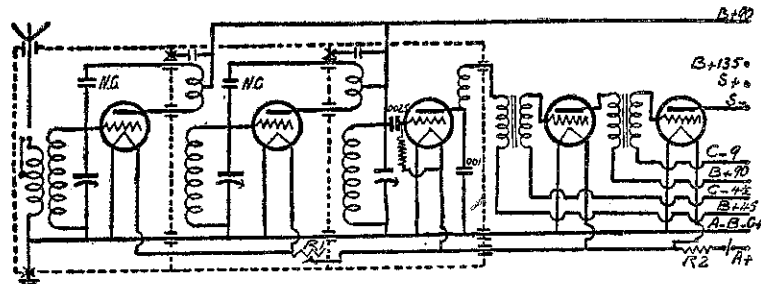
A Trouble-free Receiver with Great Capabilities



THE writer has often been asked which circuit and arrangement in his opinion is the most efficient using standard valves, coils, etc. It is a difficult question to answer, because of the multitude of "stunt" circuits available. Details are seldom given with the question as to the number of valves proposed to be used or to the depth into his pocket the prospective builder is prepared to go. There are many who just require diagrams of two or three valve sets and this class can be soon satisfied by

when the set is finished the chances of trouble are very remote. As it will be seen, each stage is completely shielded with by-pass condensers to confine each set of oscillations to their own compartment. The wiring is extremely simple as each screening box is wired up practically the same. If the shields are securely fastened together by brass bolts and the A—lead of each filament secured to the shields then these will act as the filament return and render

"By PENTODE"



running through the numerous small circuits that have been proved to be suitable for this country.

When, however, it comes to a multi-valve receiver of five or six valves the matter has to be given more careful consideration. Not a few of the published circuits of these larger sets are quite suitable for an experienced builder to tackle, but the man who anticipates building his first receiver has to tread warily, choosing a circuit having a good latitude of safety for any mistakes in lay-out, etc., due to inexperience. How many otherwise enthusiastic radio builders have been turned right off wireless through a failure when building their first set. More experienced workers have also often been frankly puzzled over the indifferent results from a multivalve receiver.

The writer has been in close touch with many set builders and 99 per cent. of the poor results obtained from a home-built set has been beyond doubt due to the general arrangement and not the circuit.

The poor theoretical diagram gets blamed every time and the common cry is that "this and that circuit is no good, I've tried it."

What is a Good Receiver?

RETURNING once more to the question of the most efficient receiver. "Pentode" considers that the straight five-valve shielded receiver, to be now described, to be one of the most efficient. Of course, this is just using standard three electrode valves, standard coils, condensers, etc. Speaking of general efficiency, it is meant to include ease of control, reliability and certainty of results. When correctly neutralised it will not oscillate.

The actual circuit is by no means recent and there is little difference between this and published details of most five-valve receivers. It is the general lay-out that differs, and precautions have been taken so that

very often makes the receiver far more stable in operation. Especially is this necessary if long speaker leads are used.

A rheostat is used to control the volume by regulating the filaments of the first two valves. In the positive lead controlling the detector and audio filaments is inserted a fixed resistance of

small value (an amperite may be used and the value of this can be easily calculated when the type of valves to be used is known. It is a great mistake to try to control volume by dimming the audio-frequency valves. Whatever the volume these should be kept operating at their correct temperature and all the control be done from the radio-frequency end. The main switch is arranged to work in conjunction with the speaker, plug and jack. To withdraw the plug cuts off all batteries.

A list of components is given, as this often proves helpful when buying.

Making the Shield.

THE screening box will first be described for those who desire to make their own. It will perhaps be easier if it is stated that it is merely a metal box, 6in. high, 15in. long, and 9in. from back to front, with a movable lid, and divided into three compartments each five inches wide. Lay the sheet of aluminium, copper would do just as well, on a flat surface, and mark out before cutting. Although a sheet only 15in. wide is necessary, the sheets are usually of a standard width, 24in., and a strip will be left over. This is unavoidable if the whole is to be made from one piece.

The sizes and shape are given, and a 1/2in. overlap should be left as in previously-described screens. The front is cut in one piece so that it will have no rivets or bolts to prevent it from lying flush with the front panel. The partition separators are best bolted into place from the back and screwed to the baseboard through the bottom of the main metal can. There is no necessity to fasten the front edge unless the whole is made of copper, when

hold firmly while holes are drilled through the joints to take small nuts and bolts or rivets. These joints along the bottom can be fixed by screwing directly into the baseboard.

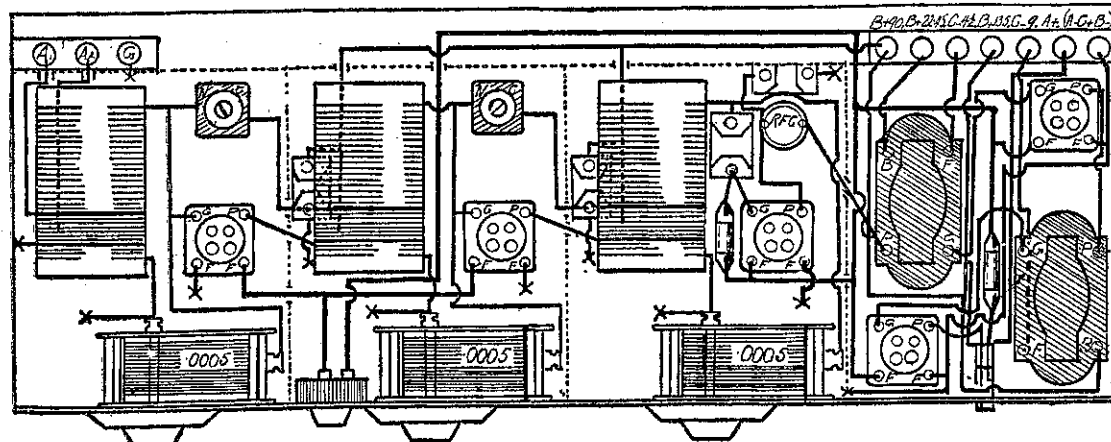
Before finally fixing the partitions into place, drill holes where indicated through which the insulated leads go from one compartment to the next. These should be about 3-16in. diameter, and about 2in. from the bottom. The first partition will need three holes and the next two holes. The holes round the outside can be drilled afterwards. The lid comes next, and should be made quite flat, so that it will rest down evenly, making a more or less radio tight joint.

Mounting the Components.

BEFORE fixing to the baseboard and panel, mount the three variable condensers, or one in each compartment. If of the single hole mounting type one hole is sufficient, making sure it is in such a place that the moving vanes cannot foul the metal screen.

In the middle compartment, between the left-hand and centre condensers, is mounted the rheostat. There will be room for this at the bottom left-hand corner of the centre division. If not, then a portion of the metal screen will have to be cut away. Be careful note if either of the terminals or the centre spindle of the rheostat is liable to touch the metal screen. It must be carefully insulated therefrom, even if a large hole has to be cut in the screen. Dismantle these components, and after screwing the panel to the baseboard lay the screening box in position. This has to be towards the left-hand side, and close to the panel, with a sharp scribe mark through the holes in the aluminium front to the ebonite panel, showing where holes have to be drilled to mount the condensers and rheostat.

Before attempting to drill for the speaker jack, arrange the components on the audio side and let the jack lie



it can be soldered, including all the seams.

To bend the aluminium clamp firmly between two straight pieces of wood, with the line along which the bend is to be made just showing. Now bend sharply and lay a flat piece of wood along the bend which can be tapped gently. When the box is bent to shape,

between the second transformer and the last valve. The various 3-16in. holes can be drilled around the outside, half an inch from the bottom, in the positions shown in the layout diagram.

Making the Coils.

BEFORE anything further can be done to the set, the coils have to